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Herpestes auropunctatus.

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Herpestes auropunctatus (Hodgson, 1836)

Small Indian Mongoose

Mangusta auropunctata Hodgson, 1836:235. Type locality "central Nepal."

Herpestes nepalensis Gray, 1837:578. Type locality "northern India."

Mangusta pallipes Blyth, 1845:346. Type locality "Candahar, Afghanistan."

Herpestes persicus Gray, 1864:554. Type locality "Mohammerah, western Persia."

Mungos rubrifrons Allen, 1909:240. Type locality "Mount Wuchi, Hainan, China."

Mungos siamensis Kloss, 1917:215. Type locality "Muang Prae, Northern Siam."

Herpestes auropunctatus: Ellerman and Morrison-Scott, 1951:295. First use of current name combination.

CONTEXT AND CONTENT. Order Carnivora, Superfamily Feloidea, Family Herpestidae, Genus *Herpestes*. The genus *Herpestes* contains 14 species (Nowak and Paradiso, 1983), *H. auropunctatus, H. brachyurus, H. edwardsi, H. fuscus, H. hosei, H. ichneumon, H. javanicus, H. naso, H. pulverulentus, H. sanguineus, H. semitorquatus, H. smithi, H. urva*, and *H. vitticallis*. The following five subspecies are recognized (Ellerman and Morrison-Scott, 1951):

H. a. auropunctatus Hodgson, 1836:235, see above.
H. a. birmanicus Thomas, 1886:84. Type locality "Pegu, Burma."
H. a. pallipes Blyth, 1845:346, see above.
H. a. rubrifrons Allen, 1909:240, see above.
H. a. siamensis Kloss, 1917:215, see above.

DIAGNOSIS. *Herpestes auropunctatus* (Fig. 1) is the smallest of the Asian *Herpestes*. A condylobasal length of <70 mm separates *H. auropunctatus* from the other larger species (Bechthold, 1939). *H. edwardsi*, which shares the coat pattern of alternate gray-brown and yellow banding of individual hairs that give a speckled or grizzled appearance, has dorsal hair 35 mm in length compared to <30 mm for *H. auropunctatus*. The African members of the genus are not sympatric with *H. auropunctatus* and all have condylobasal lengths >70 mm, except *H. pulverulentus* and *H. sanguineus*. *H. sanguineus* is similar to *H. auropunctatus* in coat color, but has a black tail tip and the skull of *H. sanguineus* has 38 teeth compared to 40 or 42 in *H. auropunctatus*. The dark-sooty coat color of *H. pulverulentus* distinguishes it from *H. auropunctatus* (Dorst and Dandelot, 1969).

GENERAL CHARACTERS. The body is slender with short legs. The head is elongated with a pointed muzzle. The tail is robustly muscular at the base and tapers gradually throughout its length. Length of head and body is 509 to 671 mm. Ears are short and project only slightly beyond the pelage. Feet are pentadactyl with long sharp non-retractile claws. Hair is short. Skull (Fig. 2) is elongate with the orbit ringed by bone. Palate is elongate, the width between the carnassials is three times the length. Posterior chamber of the tympanic bulla is little inflated, projecting subequally with or slightly less than the anterior chamber (Harrison, 1964). Both sexes have an extensible anal pad with ducted glands lateral to the anus (Gorman et al., 1974; Pocock, 1916). The dental formula is i 3/3, c 1/1, p 4/4, m 2/2 (2/3), total 40 or 42. The presence of a third molar in the lower jaw is rare.

There is distinct sexual dimorphism. Females range in length from 509 to 578 mm with a mean of 540 mm. Length of head and body ranges from 214 to 385 mm with a mean of 303. Body mass at sexual maturity ranges from 305 to 662 g with a mean of 434 g. Males have a wider head and more robust body ranging in length from 544 to 671 mm with a mean of 591 mm. Length of head and body ranges from 222 to 446 mm with a mean of 340 mm (Nellis and Everard, 1983).

Mean skull measurements (in mm, range in parentheses) of 50 adult females from St. Croix, Virgin Islands, are: condylobasal length, 61.8 (59.1 to 64.6); zygomatic width, 30.3 (28.4 to 32.1); width of toothrow, 19.2 (17.9 to 20.7); width of braincase, 22.1 (20.9 to 23.1); postorbital constriction, 10.5 (9.0 to 12.1); rostral width, 10.8 (10.0 to 12.1). For 50 adult males the measurements are: condylobasal length 66.5 (63.4 to 69.4); zygomatic width, 34.2 (29.8 to 36.4); width of toothrow, 20.6 (19.2 to 22.4); width of braincase, 23.4 (21.3 to 24.7); postorbital constriction, 10.9 (9.3 to 12.9); rostral width, 11.9 (10.8 to 13.1).

DISTRIBUTION. *Herpestes auropunctatus* is native to northern Saudi Arabia, Iran, Iraq, Afghanistan, Pakistan (Roberts, 1977), India (south to Sind on the west and Orissa on the east; Pocock, 1937, 1941), Nepal, Bangladesh, Burma, Thailand (Lekagul and McNeely, 1977), Malaysia (Medway, 1969), Laos, Vietnam, and southern China including Hainan Island (Allen, 1938; Fig. 3). The species has been introduced to (year of introduction in parentheses) Antigua, Barbados (1877), Beef Island, Buck Island (1910), Cuba (1866), Fiji (1883), French Guiana, Grenada (1882), Guadeloupe, Guyana, Hawaii (1883), Hispaniola (1895), Jamaica (1872), Jost Van Dyke, La Desirade, Lavango, Mafia (Tanzania), Marie-

FIG. 1. Photograph of *Herpestes auropunctatus*.

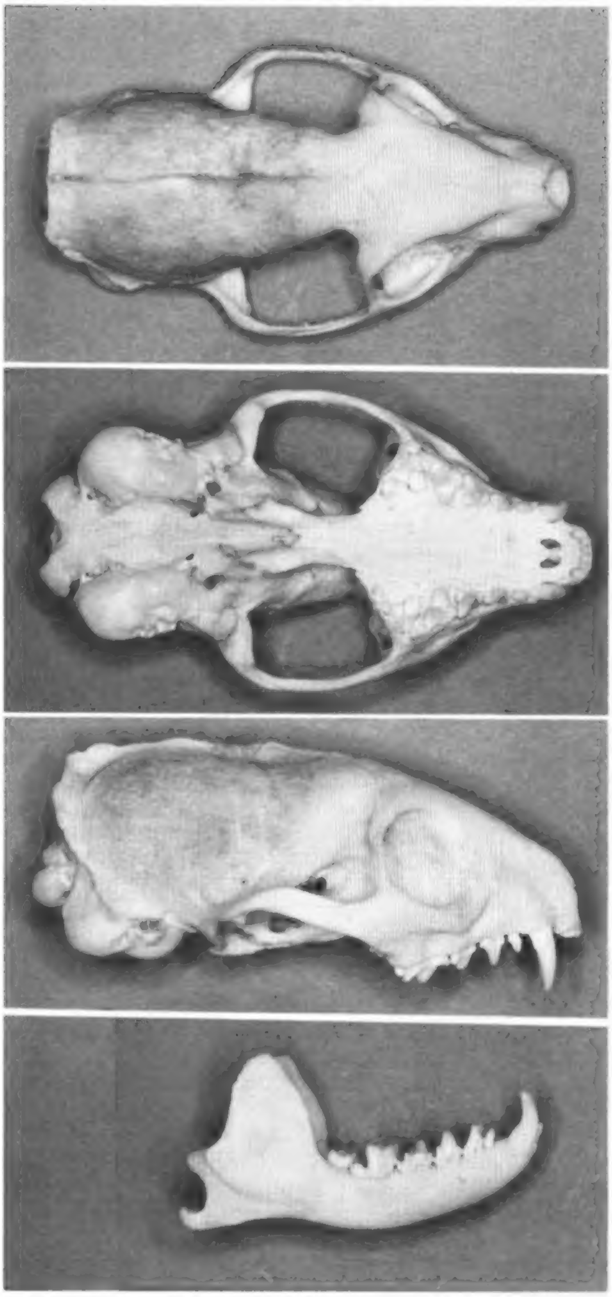

FIG. 2. Dorsal, ventral, and lateral views of skull and lateral view of mandible of *Herpestes auropunctatus*. Greatest length of skull is 67.5 mm.

Galante, Martinique, Maui (1883), Molokai (1883), Nevis, Oahu, Puerto Rico (1887), St. Croix (1884), St. John, St. Kitts (1884), St. Lucia, St. Martin (1888), St. Thomas, St. Vincent, Suriname (1900), Tortola, Trinidad (1870), Vieques, and Water Island (Nellis and Everard, 1983). There are no known fossils of *H. auropunctatus.*

FORM. The rhinarium is naked, blackish, and slightly motile; the vibrissae are sparse and inconspicuous. Eyes are small with a brown iris. The first digits of the feet are set behind the others. The palms and soles are naked and dusky colored. The pelage is coarse with scanty underfur. The general body color varies considerably within a population from the buff of dead grass to rufous or dark-yellowish gray. Albinism rarely occurs. Totally black melanism has not been recorded, but dark gray-brown individuals occur. There are six functional mammae, but only the posterior four are regularly used (Nellis and Everard, 1983).

The skull (Fig. 2) is narrow with a long braincase. The width of the postorbital constriction is less than the width of the interorbital constriction. The sagittal crest is weak, particularly in females, but the lambdoidal crest is well developed. The supraoccipital is slanted so that the occipital condyles form the most posterior projection of the skull. The mandible is slender and bowed with its lower margin strongly convex. The incisors form an almost straight row. The canines are long, slender, and slightly recurved. The p1 is small and practically functionless, p2 is laterally compressed and double rooted with a large-median cusp, p3 is triple rooted and triangular in outline, p4 is well-developed transversely, m1 is twice as wide as long, m2 is small and set obliquely in the jaw (Harrison, 1964).

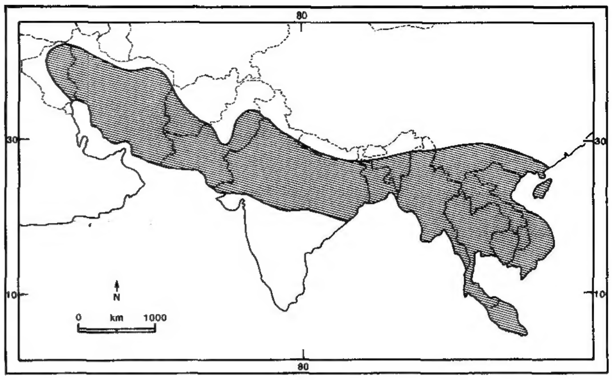

FIG. 3. Original distribution of *Herpestes auropunctatus.*

The pectoralis major is composed of the pars clavicularis, manubrialis, sternocostalis, and abdominalis. The pectoralis minor is an independent muscle. As in the dog, the scalenus dorsalis is divided into dorsal and ventral parts. The scalenus medius is present, but the scalenus ventralis is absent. The brachicephalicus was formed of the cleidocervicalis and cleidooccipitalis (Popesko and Cespedes Diaz, 1975).

Whole blood characteristics are packed cell volume, 50%; hemoglobin, 112 g/l; white blood cells/cc × 10^3, 11.2; red blood cells/cc × 10^6, 11.2; eosinophils, 0.31; basophils, 0.07; juvenile neutrophils, 0.22; band neutrophils, 3.51; segmented neutrophils, 56.53; lymphocytes, 37.64; monocytes, 1.45 (Palumbo and Perri, 1974). Serum characteristics are: glucose, 1.04 g/l; triglycerides, 0.41 g/l; cholesterol, 2.47 g/l; total bilirubin, 2 mg/l; osmolality, 367 milliosmols/l; total protein, 76 g/l (Lenz et al., 1976). Blood can be divided into three groups; that with isoagglutinogen only; that with isoagglutinin only; and that with neither isoagglutinogen nor isoagglutinin (Hinsley and Yokoyama, 1970).

A cellular layer equivalent to the stratum compactum in the stomach of the cat is interposed between the mucosa and submucosa of the entire digestive tract from the esophageal junction of the stomach to the rectum. A prominent appendix-like caecum also is present (Palmiter and Horst, 1982).

The kidney of *H. auropunctatus* is unilobular with one papilla, but the length of the papilla and relative medullary thickness are not as great as expected on the basis of urine concentrations. The renal arterial supply is conventional, but the venous drainage is unusual in that the cortex and medulla have separate venous outlets. After leaving the efferent glomerular arteriole, the typical capillary bed is encountered. However, rather than coursing deep into the medulla as vasa rectae, many of these capillaries drain by a series of even larger vessels towards the surface. Immediately below the capsule these veins form a network on the cortical surface, reaching the hilus before entering the renal veins. The medulla has a typical venous drainage. This separation of cortical and medullary drainage (present in some fields) may enable the mongoose to maintain higher concentration-gradients in the kidney and hence achieve higher urine concentrations than possible for more typical kidneys of similar dimensions (Nellis and Everard, 1983).

The left adrenal gland is somewhat elongated and flattened; the right gland is 20% smaller. Both lie closely against the dorsal body wall medial to the anterior poles of the kidneys. Relative mass of the adrenals decreases as body mass increases. Adrenals are only slightly larger in young females than in young males, but at sexual maturity they enlarge greatly in females and remain much larger than in males. In lactating females, the adrenals are significantly larger than those in other females (Tomich, 1965).

The female reproductive tract has a bipartite uterus with long oviducts. A claw-shaped baculum ranging from 5 to 15 mm in length is present in males. Seminal vesicles are lacking (Pearson and Baldwin, 1953). The prostate is composed of several lobes that open separately to the urethra. The bean-shaped bulbo-urethral glands are 20 mm posterior to the prostate and are enclosed in a thick layer of muscle tissue (Mokkapati and Dominic, 1977).

The retina is adapted for color vision. The photoreceptor population consists of 25 to 40% cones that are differentiated at the light-microscopic level on the basis of ellipsoidal size and of position in the outer retina. The retina has an elaborate inner-retinal vascular system that extends to the plexiform layer (Hope et al., 1982).

FUNCTION. There is an extensible fleshy pad surrounding the anus. Ducts opening to this pad from pockets on each side of the anus exude a thick fluid produced by bacterial action on sebum and apocrine secretions. Extracts of the anal pockets contain saturated carboxylic acids; acetic, propionic, isobutyric, butyric, isovaleric, and valeric acids. The relative and absolute concentrations of these secretions vary from one individual to another (Gorman et al., 1974). Small Indian mongooses can discriminate between secretions of conspecifics and between mixtures made from the pure acids (Gorman, 1976*a*).

The general composition of milk is: total solids, 23.4%; ash, 1.1%; lactose, 2.4%; protein, 8.9%; fat, 12.0%; citrate, 180 mg/ml; calcium, 202 mg/ml; phosphorus, 161 mg/ml; nonprotein nitrogen, 210 mg/ml. The fatty acid composition is: short chains, 1.0%; palmitic, 21.8%; palmitoeic, 4.2%; other long chains, 4.2%; 6%; stearic, 9.1%; oleic, 45%; linoleic, 13.1%; unknown, 1.6%. Lactose is the principal sugar with a significant amount of inosital and traces of glucose and galactose. The gel-electrophoretic pattern of whey proteins differs from that of milk of other carnivores in the presence of fewer proteins (Nellis and Everard, 1983).

Herpestes auropunctatus is adapted to a modest range of ambient temperatures. With a normal body temperature of 39.5°C they are able to maintain their core temperature in an environment ranging from 10 to 41°C (Nellis and McManus, 1974). The metabolic response to cold is an increase up to threefold in oxygen consumption. In a hot environment respiratory frequency increases and evaporative heat loss exceeds metabolic heat production (Ebisu and Whittow, 1976). Evaporative cooling from respiration is more important than cutaneous heat loss at high ambient temperatures (Matsuura et al., 1977). The metabolic rate exceeds the 50 kcal day^{-1} kg^{-1} predicted by the general formula of Kleiber (1961). A resting metabolic rate of 71.4 kcal day^{-1} kg^{-1} (Lin and Kobayashi, 1976) agrees with the 76 Kcal/day that can be calculated from oxygen consumption data presented by Ebisu and Whittow (1976). Mean metabolic rate for freely exercising animals is 136 kcal day^{-1} kg^{-1} (Nellis and Everard, 1983).

Heart rate of resting restrained small Indian mongooses is about 252 beats/min yielding an output volume of 334 ml/kg of body mass and an aortic blood pressure of 114 mm Hg (Lin and Kobayashi, 1976). Fat is deposited primarily in the tail. The tail has up to seven times the fat content of the body (Nellis and Everard, 1983).

Wild small Indian mongooses from a xeric habitat can produce urine with a concentration of 5,000 milliosmols. In the laboratory on a water restricted diet they can produce urine concentrations of over 6,000 milliosmols.

ONTOGENY AND REPRODUCTION. Ovulation is induced by copulation (Hoffman and Sehgal, 1976; Nellis and Everard, 1983; Pearson and Baldwin, 1953). Transmigration of the blastocyst into the opposite uterine horn before implantation is common. Gestation is approximately 49 days. Mean litter size is slightly over two with a range of one to five (Nellis and Everard, 1983).

Timing of reproduction seems to be set by length of day. The maximum frequency of pregnancies occurs just prior to the summer solstice, both north (Nellis and Everard, 1983; Pearson and Baldwin, 1953) and south of the equator. The seasonal cycle of the male reproductive tract is similar; testes, prostate, and epididymides mass increase after the winter solstice (Gorman, 1976*b*). Anterior pituitary, thyroid, adrenal, testes, prostate, sperm count, androgen, luteinizing hormone, and follicle-stimulating hormone are greater in mass or concentration from February to July than from August to January (Soares and Hoffman, 1982*c*). Seasonal variations in serum luteinizing hormone can be at least partially accounted for by a seasonal change in anterior pituitary responsiveness to gonadotropin releasing hormone (Soares and Hoffman, 1982*b*). During the winter, the concentration of luteinizing hormone binding sites in the testes increases leading to increased androgen secretion (Soares and Hoffman, 1982*a*). The reproductive system of males responds to day length manipulations. However, the effects are less pronounced than in other seasonal breeders (Soares and Hoffman, 1981, 1982*c*). The percentage of basophils in the pituitary pars distalis of females shows a striking decline in the summer non-breeding season (Nelson and Inao, 1982).

At birth the dorsal surface is covered with light-gray hair with only sparse hair on the abdomen. Mass is about 21 g. The vibrissae are prominent. The incisors and eruptive cones of the canines can be seen. Claws are well developed, ears are closed, and mewling vocalizations occur with disturbance. Eyelashes are visible (Nellis and Everard, 1983). At 2 weeks the incisors are fully in place and canines have erupted. By 22 weeks all permanent teeth are in place (Tomich and Devick, 1970). The eyes open between 17 and 20 days. Two-thirds of the body mass is attained by 4 months with most other body characteristics showing similar development. Maturity is reached by 1 year of age (Nellis and Everard, 1983).

Effective levels of spermatogenesis begin in the testes at a body mass of about 400 g. The baculum reaches adult size (6.5 mm) and mass (14 mg) by 5 months of age or a body mass of 500 g. The mass of the lens of the eye is the most reliable estimator of age, particularly post puberty (Nellis and Everard, 1983). The closure of skull sutures in young animals provides an estimate of age in days. In males and females, respectively, the median age of closure is: frontal-jugal, 266, 180; basioccipital-basisphenoid, 275, 220; median palatine, 361, 300; median nasal, 386, 279; frontal-parietal, 470, 335. The median age of epiphyseal fusion of the long bones in males and females, respectively, is: proximal femur, 250, 175; distal femur, 484, 295; proximal tibia, 485, 300; distal tibia, 225, 190 (Nellis and Everard, 1983).

The estrous cycle is about 3 weeks in the absence of pregnancy, with estrus lasting 3 to 4 days (Asdell, 1964; Nellis and Everard, 1983). Animals in the wild may live until their teeth are worn below the gum line with no apparent adverse influence on their health. In captivity, with a less abrasive diet, *H. auropunctatus* >10 years of age show only moderate tooth wear and no overt signs of advanced age (Nellis and Everard, 1983).

ECOLOGY. The ecology of *H. auropunctatus* primarily is known from studies on introduced populations on tropical oceanic islands, where it has been introduced for rodent control in sugar cane. While exercising some control on the economically devastating roof rat (*Rattus rattus*) the major influence of the small Indian mongoose has been the extinction or extirpation of fauna that have evolved in the absence of terrestrial predators (Nellis and Everard, 1983).

Within 2 years, small Indian mongooses nearly eliminated the rat problem in the sugar cane fields where they were released in Jamaica (Espeut, 1882). They greatly reduced the population of *Ameiva* lizards in Grenada and on Barbados they were a great menace to the raising of chickens, turkeys, and ducks, because the young birds are easy prey (Allen, 1911). After their introduction, the fer-de-lance (*Bothrops atrox*), once common in Martinique and St. Lucia, became unknown on St. Lucia and rare on Martinique (Barbour, 1930).

The effect of small Indian mongooses on a native animal population in Trinidad was varied. Rats were uncommon in canefields, but remained common in towns and around estate buildings. The three genera of opossums (*Didelphis*, *Philander*, *Marmosa*) remained common. No species of bird was exterminated, although populations of tinamou (*Crypturellus soul*) and certain other ground-nesting or ground-feeding birds were reduced. The ground lizard (*Ameiva surinamensis*) was not as common as formerly, except around towns and villages with lower populations of small Indian mongooses (Urich, 1931). Many of the small ground-inhabiting snakes became rare. Although extirpation of many species has occurred on large islands having *H. auropunctatus*, remnant populations of the prey species frequently continue to exist on small nearby islands. The St. Croix ground lizard (*Ameiva polops*) has been extirpated from St. Croix by the mongoose, but it continues to maintain viable populations on nearby Green and Protestant cays, the latter being <122 m from the shore. Small Indian mongooses introduced to LeDuck Island eliminated an abundant population of *Ameiva exsul* within a 6-month period (Nellis, 1982).

Certain species have modified their behavior in response to the

presence of mongooses. The roof rat is now almost completely arboreal on St. Croix, and the bridled quail dove (*Geotrygon mystacea*), which previously nested on the ground and was thought to be extinct in 1921, now nests in low trees and has become moderately common (Nellis and Everard, 1983).

Home ranges are 2.2 ha for females and 4.2 ha for males. Home ranges of males overlap both male and female ranges as do home ranges of females. Activity is mostly restricted to a small core area. A sample of 474 small Indian mongooses showed that 88% of those in the wild are >2 years of age. Population densities in the Caribbean vary from 1 to 10/ha (Nellis and Everard, 1983).

Introduced mongooses do not seem to have carried any parasites or diseases to new habitats. *H. auropunctatus* commonly carries cat fleas (*Ctenocephalides felis*; Pimentel, 1955*a*). Other fleas found on them in Hawaii are *Echidnophaga gallinacea*, *Xenopsylla cheopis*, *X. hawaiiensis*, *Nosoppsyllus fasciatus*, *Leptopsylla segnis*, and *Pulex irritans* (Cole and Koepke, 1947; Eskey, 1934). The ticks *Ornithodorus puertoricensis* and *Amblyoma* are found on them in the West Indies. *Aponomma pattori*, *Haemaphysalis histricus*, and *H. larangei* occur on small Indian mongooses in Danang, Vietnam (Hoogstraal et al., 1968). *H. auropunctatus* seem to be the preferred hosts of *Haemaphysalis indica* in Pakistan, India, and Sri Lanka (Hoogstraal, 1970). The mite *Notoedres cati* has caused several outbreaks of mange in areas with high densities of the small Indian mongoose in the Virgin Islands (Nellis and Everard, 1983). This mite also has been reported from Hawaii (Garrett and Haramota, 1967). Other parasitic mites found on mongooses are *Androlaelaps*, *Eutrombicula goeldii*, *Ornithonyssus bacati*, *Glypthalaspis americana* (Nellis and Everard, 1983), and *Euschongastia downsi* (Brennan and Jones, 1960). Bot flies (*Cuterebra*) have been found on *H. auropunctatus* (Everard and Aitken, 1972). The louse *Felicola rohani* was collected on *H. auropunctatus* in Katmandu (Emerson, 1971). Acanthocephala (Oligocanthorynchidae) have been found in *H. auropunctatus* from St. Croix and Trinidad (Nellis and Everard, 1983). The intestinal nematodes *Physaloptera* (Nellis and Everard, 1983), *Capillaria* (Huizinga et al., 1976), *Skrjabinocapillaria* (Khalil, 1977), and *Strongyloides* (Webb, 1972) have been found in mongooses in the West Indies.

Rabies is the most important disease transmitted by *H. auropunctatus*, which repeatedly has been identified as a vector of rabies in the Caribbean (Everard et al., 1972, 1974, 1979*a*, 1981). Leptospirosis is probably the second most important human disease carried (Everard et al., 1976, 1979*c*; Nellis and Everard, 1983). Other diseases reported are: canine distemper, canine hepatitis, feline panleukopenia, toxoplasma, streptococcus (Nellis and Everard, 1983), pulmonary virus (Hayashi and Stemmermann, 1972; Weir and Horsfall, 1940), and salmonella (Everard et al., 1979*b*).

BEHAVIOR. *Herpestes auropunctatus* is swift and aggressive, frequently dominating other predators such as cats that may have a mass five times larger. Onset of estrus in captive females is shown by restlessness and increased marking. Several males may be in attendance to one estrous female. Screaming, barking, and chasing among the males is common. The male accepted by the female is not necessarily the most socially dominant individual of the courting group. Both sexes are polygamous. In captivity, small Indian mongooses may copulate several times a day in the absence of estrus, and with increasing frequency during estrus. Females in the later stages of pregnancy show an increasing antagonism toward adult males. Birth in captive animals is at night, usually shortly after sundown. Neither captive females nor wild females use nesting material (Nellis and Everard, 1983).

The young make their first excursions from the den at about 4 weeks of age and may follow the mother on hunting trips at 6 weeks of age. Young mongooses exhibit a strong following response. The most common form of play is an undirected dashing about (Nellis and Everard, 1983).

Herpestes auropunctatus is diurnal with activity commencing and ceasing at a light level of 5 footcandles with most activity between 1000 and 1600 h. They mark prolifically by wiping objects in the environment with their anal pad. Marking also occurs as a displacement activity by the vanquished in agonistic social encounters (Nellis and Everard, 1983). Vocalizations are extremely varied and can be divided into categories including weep, squawk, honk, ruck-a-ruck, pant, spit, bark, chuck, scream, and growl (Mulligan and Nellis, 1975).

Small Indian mongooses move through dense cover in a sinuous-serpentine manner scarcely rustling dry grass. Gaits include walk, trot, and gallop. *H. auropunctatus* can climb, but is rarely found far above the ground. They can easily jump to the top of a smooth 1.2 m barrier. When in the open, they hold themselves close to the ground and progress in a slinking manner. When staring fixedly at a questionable object, they will weave their head from side-to-side to increase the visual parallax base. They are seldom active on rainy days or when the grass is wet with dew. They show a great reluctance to enter water more than a few centimeters deep. If forced to swim they demonstrate adequate skill, but poor endurance (Nellis and Everard, 1983).

Herpestes auropunctatus has several characteristic postures. When moving in grass that is taller than the animal, it may pause and sit firmly in a vertical position on the haunches. In a more alert state, or when additional elevation is needed, it may stand erect on its hind feet braced by the muscular tail. In an agonistic encounter, it will arch its back and tail accompanied with pilo-erection. Its stance will be more digitigrade as it moves laterally toward the opponent with a rocking gait. When alertly resting or in heat stress, *H. auropunctatus* may lay with the hind feet extended posteriorly and the front feet extended anteriorly. Typical sleeping posture is attained by curling into a tight circle with the mass being supported by the hindquarters and the dorsal aspects of the shoulders, and the snout pointing vertically (Nellis and Everard, 1983).

From an early age, through adulthood, small Indian mongooses show an extreme food envy. An individual fed to satiation will vigorously try to take food away from a feeding conspecific. Mothers use this instinct in teaching young to feed, but adult manifestations result in much chasing and vocalization. Small Indian mongooses scratch or dig vigorously under the slightest provocation. Both paws may be used simultaneously in a soft substrate or they may be used alternately. When reaching into a hole or crevice, most animals are right handed, showing considerable manipulative dexterity. Kill-behavior is efficient and stereotyped for vertebrate prey. "Such is the dental apparatus of these famous snake killers, eminently fitted to deliver small but grievous bites in the head of serpentes" (Gregory and Hellman, 1939:371). A bite from the side of the head drives the thin canines into the brain and vertebral column of rodents, birds, and snakes. Potentially retaliatory items such as centipedes (*Scolopendra*) and scorpions (*Centuroides*) are bitten and repeatedly tossed before being consumed (Nellis and Everard, 1983).

Herpestes auropunctatus is omnivorous (Gorman, 1975). In 56 stomachs from Puerto Rico, 315 food items were 88.9% animal and 11.1% plant material. Insects made up 56.4% of the animals and the remainder (in percent) included: reptiles, 17.1; myriapods, 12.1; arachnids, 7.9; mammals, 2.9; crustaceans, 1.4; asteroids, 1.1; and amphibians, 1.1 (Pimentel, 1955*a*). On St. Croix, stomach contents (in percent) were composed of: lizards (*Anolis*), 0.5; toads, 13.9; mice (*Mus musculus*), 13.9; rats (*Rattus rattus*), 13.9; birds, 2.8; poultry, 2.8; insects, 83.0; crabs, 11.1; fruit, 11.1; and vegetable matter, 5.5 (Seaman, 1952). Parts of the insects *Helicopric bucephalus*, *Anthic sexguttata*, *Blap orientalis*, *Onthophagus longicornis*, and *Grylus sagillatus* and a scorpion were found in the stomachs of two small Indian mongooses collected in the Rajasthan Desert in India (Prakash, 1959).

GENETICS. *Herpestes auropunctatus* has a sex-chromosome mechanism previously unknown in mammals (Fredga, 1965). The female has a diploid number of 36 chromosomes. the male has 35 with no apparent Y chromosome. "The study of male meiosis revealed that the X chromosome did not behave as a univalent at diakinesis and metaphasae I, but attached end-to-end to one autosomal bivalent" (Fredga, 1972:1). Small Indian mongooses in the Caribbean have been subjected to multiple genetic bottlenecks associated with sequential small founder populations (Nellis and Everard, 1983). Mongooses in the Virgin Islands show higher levels of variability in protein variation, levels of heterozygosity, and levels of polymorphism than reported for other carnivores (D. B. Hoagland, personal communication).

REMARKS. The treatment of Herpestidae as a family by Gregory and Hellman (1939) is supported by chromosomal characteristics. All members of the Viverridae bear well-defined, satellited marker chromosomes, while the Herpestidae are nearly karotypically identical and lack marker chromosomes (Wurster and Benirschke, 1968).

Control of *H. auropunctatus* on oceanic islands has been of interest for many years (Pimentel, 1955*b*). Bounties and trapping on large islands have been unsuccessful. Removal by trapping on small islands is possible (Nellis, 1982). Chemical control by use of anticoagulant baits shows promise. The LD_{50} of *H. auropunctatus* is 3.0 mg/kg for Warfarin and 0.13 mg/kg for Diphacinone (J. O. Keith, D. N. Hirata, and D. L. Espey, personal communication). *Herpestes* is from the Greek meaning a creeping thing; *auropunctatus* is from the Latin meaning gold spotted.

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